NOAA CPO SARP Progress Report for award NA07OAR4310371

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Recipient Name:	University of Washington
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NOAA CPO Program element: Sectoral Applications Research Program (SARP), Climate and Water

Project objective: The goal of this project is to use a combination of hydroclimate reconstructions from tree rings, hydrologic models, and workshops to develop and disseminate information on the impacts of climate variability to water managers in the Pacific Northwest (Columbia Basin as well as the west slope of the Cascades in Washington and Oregon). The aims of the first year of the project were: (1) to hold a workshop soliciting input from managers on the nature of climate information used in decision making that could be addressed with paleoclimatic information and (2) use the geographical locations and streamflow gages indicated by managers to prioritize the collection of new and updating of existing tree-ring reconstructions.

Project progress: The first year workshop (Spring 2008, Spokane, WA) included participants from Seattle Public Utilities, Portland Water Bureau, Bureau of Reclamation, Idaho Department of Water Resources, the Climate Impacts Group, and the Western Water Assessment. Significant input from water resource managers included identification of specific gages identified in the original proposal as well as seasonal reconstruction targets. Most importantly, progress in identifying scenarios not encountered in the historical record but suggested by both the paleoclimate record and future climate change but useful for identifying potential consequences of climate change on water use and planning.

In addition, we produced test chronologies in two high elevation systems of the Columbia Basin to determine the capacity for identifying the sensitivity of tree ring chronologies in the PNW to snowpack. Initial results are encouraging, with chronologies extending back more than 1000 years possible in previously un-sampled locations. Current work to identifying the hydroclimatic sensitivity of these chronologies is ongoing. Significant geographical sampling gaps exist in the publicly available paleoclimatological record for the Columbia Basin, and especially in north central Oregon, northern and southern Idaho, these gaps overlap with areas of interest to stakeholders identified in the workshop above. We will therefore target the development of new chronologies in year 2 on these locations. Finally, we have re-evaluated chronologies developed in the PNW over the last forty years, and plan to update several of these, which is cheaper and less risky than developing new chronologies over such a wide region.

Parallels between current work on this project and a larger body of existing and current similar work in the western U.S. by Co-I Woodhouse lead to synergistic efforts on a successful cross-RISA proposal that aims to develop communication tools for the results of this work.

Project future: In year two, we will develop 8-15 new tree-ring chronologies and update as many as a dozen existing chronologies in the Pacific Northwest. We also have sufficient resources remaining in our workshop budget to facilitate two more (instead of the original single) workshops, Water managers have indicated that regional workshops would be better split into two workshops for west-Cascades stakeholders and interior Columbia Basin stakeholders. We aim to hold workshops in Spring 2009 to discuss the results of the significant scientific work to occur in Winter 2008-2009 on the development of gage reconstructions and the use of hydrologic models to simulate future streamflows given the variability observed in the paleoclimate record.

Publications: None to date

Presentations:

Hamlet, A.F. Using hydrologic models and tree-ring reconstructions in tandem. CIG SARP workshop, spring 2008.

Littell, J.S. 2008. Developing hydroclimatic reconstructions for water resources management in the Pacific Northwest. Seattle Public Utilities, 29 April 2008.

Littell, J.S. Tree-ring data for the Pacific Northwest. CIG SARP workshop, spring 2008.

Woodhouse, C. Application to water management: examples from Colorado Basin. CIG SARP workshop, spring 2008.

Woodhouse, C. and J. Littell. 2008. Tree-rings, hydrology, and reconstruction primer. CIG SARP workshop, spring 2008.